

Introduction:

When firearms discharge, lead is aerosolized. Take-home lead exposure occurs from secondary and tertiary exposures via airborne firearm dust settling on clothes and personal effects in the shooting vicinity. Post-shooting hygiene behaviors can reduce some contamination. Firearms have been ecologically associated with elevated pediatric blood lead levels (>50mg/L) at the US city, town, state, and national level. Firearm use is strongly associated with increased blood lead concentrations among shooters. Few studies quantify the prevalence of firearm use and none estimate prevalence of lead-based ammunition use or post-shooting hygiene related behaviors among all US shooters. We fill this gap.

Methods:

Cross-sectional analysis of the National Firearms Survey, a nationally representative survey conducted in December 2024. Includes adults aged 18 or older who owned a firearm, reported firing a firearm in the past year, and used lead-based ammunition (or were unsure of type) (n=1,565). Participants reported demographic/geographic characteristics and firearm behaviors. Outcomes were self-reported post-shooting hygiene behaviors:

- 1. Showering after shooting
- 2. Clean clothes before entering home
- 3. Change clothes
- 4. Change shoes
- 5. Clean personal effects
- 6. Store or isolate gear

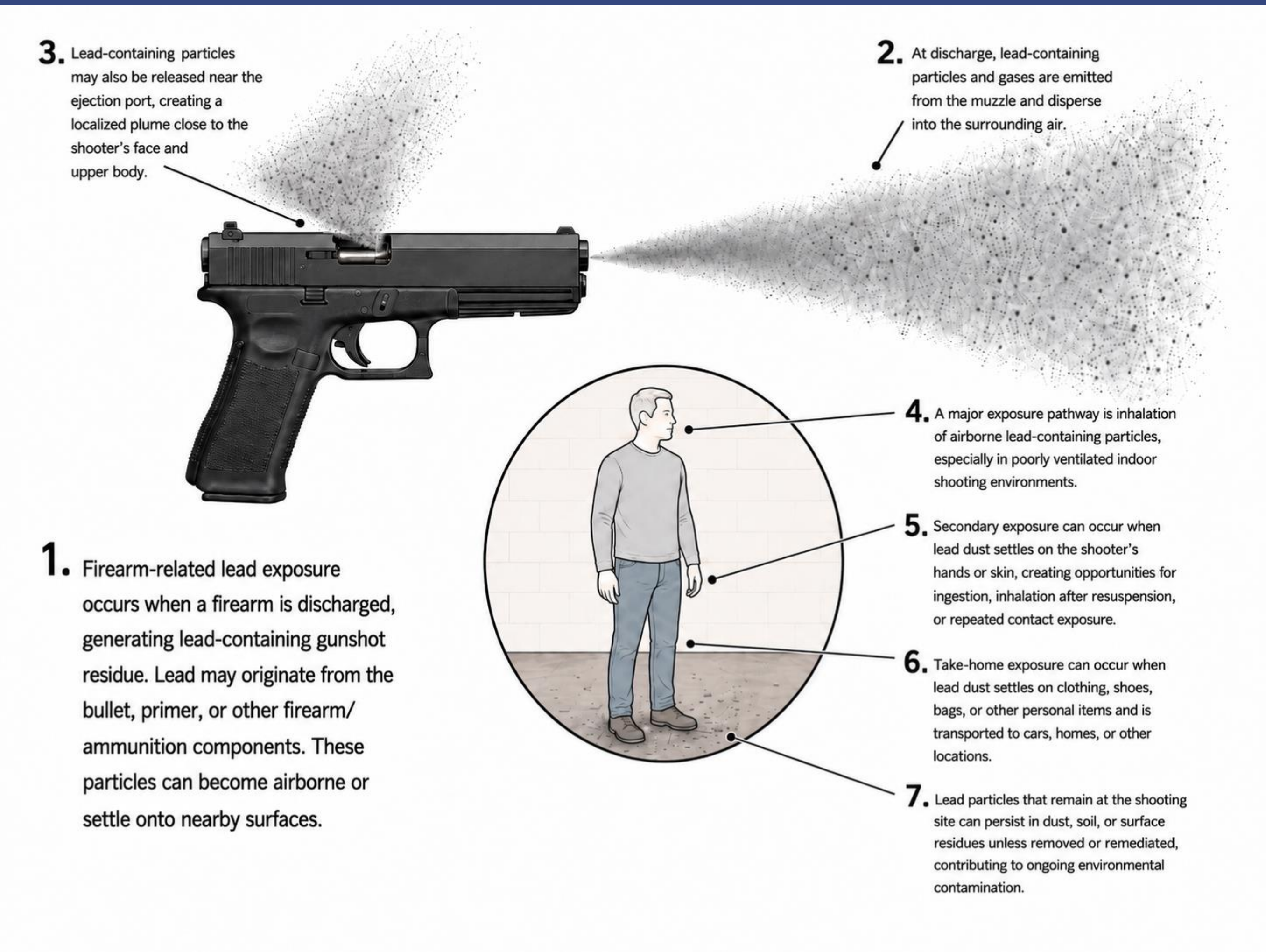
These were examined individually and as a summed continuous index using quasi-Poisson regression. Weighted percentages and rate ratios were estimated.

Lead Ammunition Use and Post-Shooting Hygiene Practices Among US Firearm Owners

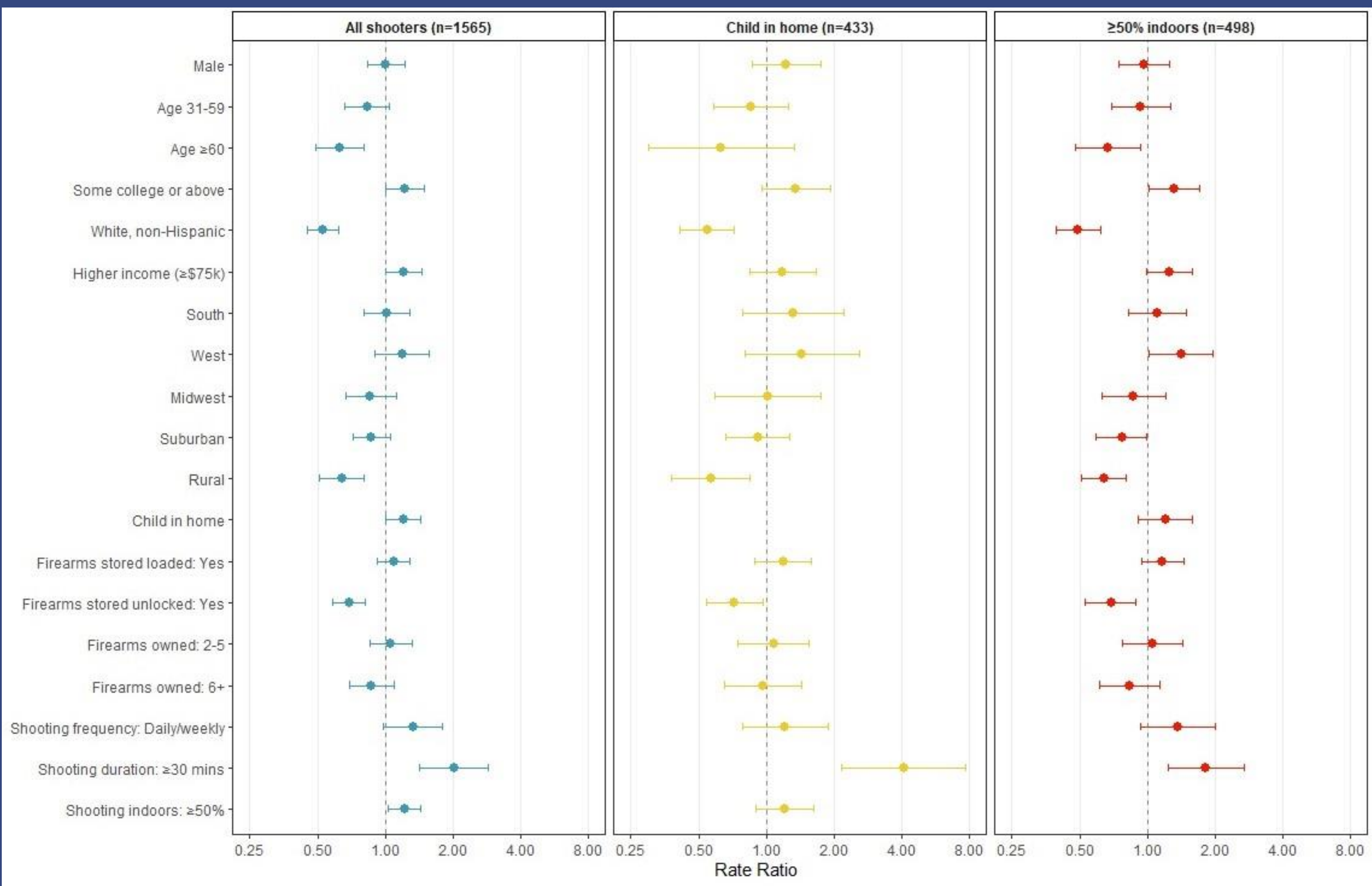
Christian Hoover, MPH^{1, 2}, David Hemenway, PhD¹

1 Harvard Injury Control Research Center, Harvard T.H. Chan School of Public Health, Boston, MA, USA

2 Brown University School of Public Health, Providence, RI, USA



Forest plot of unadjusted weighted rate ratios (RR) examining the association between demographic characteristics and total number (95% CI) of shooting-related hygiene behaviors.



Contact: CHoover@HSPH.Harvard.edu

Results:

Among US firearm owners who shot in the past year (75% male, 57% aged 31-59), **97% reported using lead-based ammunition or were unsure of type.** Most reported shooting monthly or less (94%) but for ≥30 minutes (91%); 32% primarily shot indoors. Overall, **46% (95% CI:43%–49%) engaged in no post-shooting hygiene behaviors and 30% (95% CI:27%-33%) engaged in only one.** Hygiene behaviors were higher among non-White, younger, urban-dwelling individuals with higher education and higher income, who shot more frequently and for longer durations. Approximately 6 million US children live in households where firearms with lead-based ammunition are shot annually. Of these, 3 million live with caregivers reporting no hygiene behaviors.

Discussion:

Lead-based ammunition use is universal among US shooters while post-shooting hygiene behaviors are uncommon and may be a substantial pathway for residential lead exposure. Firearm-related lead exposure may represent a preventable pathway for household lead exposure and warrants integration into lead prevention efforts. While the US is a global outlier in firearm ownership, firearm lead exposure occurs anywhere where lead bullets are shot. And there are no global standards for post-shooting firearm hygiene.



HARVARD
T.H. CHAN
SCHOOL OF PUBLIC HEALTH



BROWN